**Mole Calculation Worksheet**

1) How many moles are in 15 grams of lithium?

2) How many grams are in 2.4 moles of sulfur?

3) How many moles are in 22 grams of argon?

4) How many grams are in 88.1 moles of magnesium?

5) How many moles are in 2.3 grams of phosphorus?

6) How many grams are in 11.9 moles of chromium?

7) How many moles are in 9.8 grams of calcium?

8) How many grams are in 238 moles of arsenic?

*What are the molecular weights of the following compounds?*

9) NaOH 12) H3PO4

10) H2O 13) Mn2Se7

11) MgCl2 14) (NH­4)2SO4

15) How many grams are in 4.5 moles of sodium fluoride, NaF?

16) How many moles are in 98.3 grams of aluminum hydroxide, Al(OH)3?

17) How many grams are in 0.02 moles of beryllium iodide, BeI2?

18) How many moles are in 68 grams of copper (II) hydroxide, Cu(OH)2?

19) How many grams are in 3.3 moles of potassium sulfide, K2S?

20) How many moles are in 1.2 x 103 grams of ammonia, NH3?

21) How many grams are in 2.3 x 10-4 moles of calcium phosphate, Ca3(PO3)2?

22) How many moles are in 3.4 x 10-7­ grams of silicon dioxide, SiO2?

23) How many grams are in 1.11 moles of manganese sulfate, Mn3(SO4)7?

**Molar Mass Worksheet**

*Calculate the molar masses of the following chemicals:*

1) Cl2

2) KOH

3) BeCl2

4) FeCl3

5) BF3

6) CCl2F2

7) Mg(OH)2

8) UF6

9) SO2

10) H3PO4

11) (NH4)2SO4

12) CH3COOH

13) Pb(NO3)2

14) Ga2(SO3)3

**Moles, Molecules, and Grams Worksheet**

1) How many molecules are there in 24 grams of FeF3?

2) How many molecules are there in 450 grams of Na2SO4?

3) How many grams are there in 2.3 x 1024 atoms of silver?

4) How many grams are there in 7.4 x 1023 molecules of AgNO3?

5) How many grams are there in 7.5 x 1023 molecules of H2SO4?

6) How many molecules are there in 122 grams of Cu(NO­3)2?

7) How many grams are there in 9.4 x 1025 molecules of H2?

8) How many molecules are there in 230 grams of CoCl2?

9) How many molecules are there in 2.3 grams of NH4SO2?

10) How many grams are there in 3.3 x 1023 molecules of N2I6?

11) How many molecules are there in 200 grams of CCl4?

12) How many grams are there in 1 x 1024 molecules of BCl3?

13) How many grams are there in 4.5 x 1022 molecules of Ba(NO­2)2?

14) How many molecules are there in 9.34 grams of LiCl?

15) How many grams do 4.3 x 1021 molecules of UF6 weigh?

16) How many molecules are there in 230 grams of NH4OH?

**Percent Composition**

**1.** **What is the percentage composition of CaO?**    
  
**2.** **Calculate the mass percentage composition of each compound.**   
**a) MgCl2    b) Na2SO4      c) Fe2O3       d) C7H5N3O6       e) AlBr3•6H2O  
  
3.** **Determine the percent composition of Ca3(PO4)24.** **A sample of a liquid with a mass of 8.657 grams was decomposed into its elements and gave 5.217 grams of carbon, 0.9620 grams of hydrogen, and 2.478 grams of oxygen. What is the percentage composition of this compound?**

**5.** **The drug known as LSD has the formula C20H25N3O. One suspected sample contained 74.07%C, 7.95%H, and 9.99% N.  Are the percentages given in the question consistent for LSD within the allowed limits of error and rounding?**

**6.** **Calculate the percentage of nitrogen in the two important nitrogen fertilizers, ammonia, NH3 and urea, CO(NH2)2**

**7.** **A 27.0 g sample of a compound contains 7.20 g of C, 2.20 g of hydrogen and 17.6 g of oxygen.  Calculate the percentage composition of the compound.**

**8.** **Carbon will burn in sufficient oxygen to produce carbon dioxide. In an experiment 8.40 grams of C reacts with oxygen and 30.80 grams of carbon dioxide is produced.**   
    
**a)    What mass of oxygen reacted with the 8.40 grams of C?**   
    
**b)    Calculate the percentage composition of the carbon dioxide.**

**9.** **In one sample of a compound of copper and oxygen, 3.12 g of the compound contains 2.50 g of copper and the remainder is oxygen.  In another sample of a compound of copper and oxygen, 1.62 g of the compound contain 1.44 grams of copper and the remainder is oxygen.**   
**a)    Calculate the percentage composition of each compound.**   
    
**b)    Are the two samples the same compound?  Justify your answer.**

**10.** **Calculate the percentage by mass of the indicated elements in each of the following compounds.**   
**a)    sodium in sodium azide, NaN3(s); used in automobile air bags.**   
    
**b)    aluminum in aluminum oxide, Al2O3; the naturally occurring mineral corundum**   
    
**c)    nitrogen in dopamine, C8H11O2N; a neurotransmitter in the brain**

**11.** **A forensic scientist analyzes a sample for sodium arsenate, Na2AsO4(s), a source of arsenic.  Calculate the percentage composition of sodium arsenate.**

**12.** **A cleaning solution has the acronym, TSP, which is short for trisodium phosphate, Na3PO4.   Calculate the percentage composition of the compound.  (P.S. TSP  is not an official name for the compound.)**